

ABSTRACT

A transducer is designed and fabricated using stretched rolled electroactive polymers. The invention includes the design, fabrication, and integration of a stretched rolled actuator system with corresponding sensing, control and power subsystems. The invention presented is based on the improved performance of electroactive polymer transducers that can be achieve by prestretching the polymeric material. In this invention, the preferred stretch is maintained in a rolled configuration by introducing structural elements to the transducer. The structural elements facilitate fabrication of the transducer as well as provide a compact and efficient means of maintaining stretch and the desired boundary conditions on the electroactive polymer during operation. These conditions together are used to improve and tailor the strain response of the transducer.